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Date: 1-25-07

Application No.	**:**	**10/601,358**
Confirmation No.	**:**	**7460**
Appellant	**:**	**TASH**
Title	**:**	**AUTOMATICALLY DEFORMABLE NOZZLE REGULATOR FOR USE IN A VENTURI PUMP**
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APPEAL BRIEF UNDER 37 CFR 41.37

I. REAL PARTY IN INTEREST

The subject application is assigned to George Tash of 5777 Balcom Canyon Road, Somis, California 93066 and Debra B. Tash, of 5777 Balcom Canyon Road, Somis, California 93066.

II. RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences.

III. STATUS OF CLAIMS

1. Claims 1-20 represent all claims currently pending in the application.
2. Claims 1-20 are rejected.
3. The rejection of claims 1, 3, 9-16 and 19 is hereby appealed.

IV. STATUS OF AMENDMENTS

A Final Office Action was issued on August 25, 2006 which rejected claims 1-20. Subsequent to this Final Office Action, amendments to the claims were filed under 37 CFR §1.116 on November 13, 2006 in order to place the claims in better form for consideration on appeal. More particularly, claims 1, 2, 4-8, 15-18, and 20 were cancelled, claim 3 was rewritten in independent form to include all the limitations of its base claim 1, and claim 19 was rewritten in independent form to include all the limitations of its base claim 15 and intervening claim 16. As stated in the aforementioned amendments filed November 13, 2006, no new matter was added, nor was the scope of the remaining claims affected by these amendments.

An Advisory Action was issued on November 27, 2006 in response to the aforementioned claim amendments filed November 13, 2006. The Advisory Action stated that the claim amendments failed to place the application in condition for allowance. The Advisory Action further stated that none of the claim amendments would be entered because "[t]he proposed amended [claim] language ... raises new issues which would require additional consideration and search."

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The pending patent application includes 4 independent claims: claims 1, 9, 15 and 20. Claim 20 is not involved in this appeal. A summary of the subject matter claimed in claims 1, 9 and 15 is provided below.

a. **Subject Matter of Independent Claim 1**:

In general, the subject matter of independent claim 1 relates to an "automatically deformable nozzle regulator ... for use in a venturi pump." (refer to page 3, lines 17-18 of the specification of the Appellant's original application – hereafter simply referred to as the specification). As explained on page 6, lines 15-24 of the specification: "When incorporated into the venturi pump ... the automatically deformable nozzle regulator transforms the venturi pump into an outlet side regulated venturi pump. This is achieved because the nozzle regulator ... is made from a deformable material ... Because the nozzle regulator is deformable ... the area of the outlet nozzle can be decreased by deformation of the nozzle regulator such that the throat-to-outlet area ratio is increased. From Bernoulli's equation, it follows that an increase in the throat-to-outlet area ratio leads to a decrease in pressure at the throat."

As explained on page 6, line 26 – page 7, line 2 of the specification: "[T]he automatically deformable nozzle regulator automatically determines when additional suction force (or low pressure) is needed at the throat and decreases its output area accordingly ... this automatic determination is a physical phenomenon based on backpressure that the nozzle regulator experiences. Because the nozzle regulator is deformable, an increase in backpressure constricts the nozzle regulator and decreases its outlet area, thereby lowering the pressure at the throat and creating additional suction force."

More particularly, as explained on page 8, lines 6-7 of the specification: "The automatically deformable nozzle regulator ... is designed to be incorporated into the outlet area of a venturi pump." FIG. 3 illustrates a cutaway side view of the automatically deformable nozzle regulator 105 incorporated into a venturi pump. As explained on page 9, lines 2-6 of the specification: "FIG. 4 illustrates a cutaway side view of the automatically deformable nozzle regulator 105 ... The nozzle regulator is made of a deformable material (such as rubber) so that when acted upon by a force the nozzle regulator easily deforms but when the force is removed the nozzle regulator returns to its original shape."

As explained on page 9, lines 10-16 of the specification: "In general, the nozzle regulator 105 contains three sections: (1) an outer tubular section or cylinder 400; (2) an inner tubular section or cylinder 410; and, (c) an inlet section 420. In particular, the outer tubular cylinder 400 has a first radius, r.sub.outer, and the inner tubular cylinder 410 has a second radius r.sub.inner, with r.sub.outer> r.sub.inner. The outer cylinder 400 and the inner cylinder 410 are concentric about a longitudinal axis, shown in FIG. 4 as imaginary dashed line a-a. At one end of the nozzle regulator 105, along the longitudinal axis, is an inlet side 430." As explained on page 9, lines 24-25 of the specification: "The inlet section 420 smoothly connects the outer cylinder 400 and the inner cylinder 410 at the inlet side 430."

As explained on page 11, lines 6-15 of the specification: "The automatically deformable nozzle regulator ... automatically adjusts its output area as needed to provide an increased low-pressure area at an inlet of the venturi pump. This change in output area is achieved by decreasing the radius of the inner cylinder, r.sub.inner, at the outlet side 440 such that the output area is decreased. This decrease in the inner cylinder radius, r.sub.inner, is achieved using backpressure from the fluid. Because of the deformable nature of the nozzle regulator 105, when the backpressure is great enough the inner cylinder radius, r.sub.inner, constricts thereby decreasing r.sub.inner. Once the backpressure is relieved, the deformable nature of the nozzle regulator 105 causes r.sub.inner to return to its original value."

FIG. 1 illustrates an exemplary application of a venturi pump containing the automatically deformable nozzle regulator. The details of the operation of the nozzle regulator in this application are described in the following sections of the specification: in the replacement paragraph starting on page 7, line 4; on page 7, lines 14-27; and in the replacement paragraph starting on page 7, line 29. Further technical details of the operation of the nozzle regulator, along with various advantages of the nozzle regulator in particular operating conditions, are described on page 11, line 17 – page 12, line 28 of the specification.

In view of the preceding discussion, with reference to selected portions of the Appellant's specification, it should be clear that **the radius of the inner cylinder** of the

claimed nozzle regulator ***automatically decreases*** when a fluid flowing within the inner cylinder experiences a backpressure, and when the backpressure is removed said radius ***automatically increases*** back to its original dimension. This is in contrast to conventional nozzle regulators where the dimensions of the regulator do *not* automatically change based on changes in backpressure on the fluid flowing through the regulator.

b. Subject Matter of Independent Claim 9:

In general, the subject matter of independent claim 9 relates to an "automatically deformable nozzle regulator ... for use in a venturi pump." (refer to page 3, lines 17-18 of the specification). As explained on page 6, lines 15-18 of the specification: "When incorporated into the venturi pump ... the automatically deformable nozzle regulator transforms the venturi pump into an outlet side regulated venturi pump. This is achieved because the nozzle regulator ... is made from a deformable material."

More particularly, as explained on page 8, lines 6-7 of the specification: "The automatically deformable nozzle regulator ... is designed to be incorporated into the outlet area of a venturi pump." FIG. 3 illustrates a cutaway side view of the automatically deformable nozzle regulator 105 incorporated into a venturi pump. As explained on page 9, lines 2-6 of the specification: "FIG. 4 illustrates a cutaway side view of the automatically deformable nozzle regulator 105 ... The nozzle regulator is made of a deformable material (such as rubber) so that when acted upon by a force the nozzle regulator easily deforms but when the force is removed the nozzle regulator returns to its original shape."

As explained on page 9, lines 10-17 of the specification: "In general, the nozzle regulator 105 contains three sections: (1) an outer tubular section or cylinder 400; (2) an inner tubular section or cylinder 410; and, (c) an inlet section 420. *In particular, the outer* tubular cylinder 400 has a first radius, r.sub.outer, and the inner tubular cylinder 410 has a second radius r.sub.inner, with r.sub.outer> r.sub.inner. The outer cylinder 400 and the inner cylinder 410 are concentric about a longitudinal axis, shown in FIG. 4 as imaginary dashed line a-a. At one end of the nozzle regulator 105, along the longitudinal axis, is an inlet side 430 and at the other end is an outlet side 440."

As explained on page 9, line 24 – page 10, line 2 of the specification: "The inlet section 420 smoothly connects the outer cylinder 400 and the inner cylinder 410 at the inlet side 430. The inlet section 420 essentially is a ring or disc having a convergent cross-sectional shape (along the longitudinal axis a-a) that joins the outer cylinder 400 and the offset inner cylinder 410 at the inlet side 430. In other words, moving from the inlet side 430 to the outlet side 440 the cross-sectional shape of the inlet section 420 converges. This convergence can be seen by referring to FIG. 4, where the first radius, r.sub.outer, at the inlet section 420 is greater than the second radius, r.sub.inner, at the inlet section 420 (i.e., r.sub.outer> r.sub.inner)."

As explained on page 10, lines 15-29 of the specification: "Within the inner cylinder 410 is a fluid passageway 470 where the fluid being pumped flows through the nozzle regulator 105. FIG. 5 illustrates an end view of the outlet side 440 of the automatically deformable nozzle regulator 105 ... Specifically, the outer cylinder 400 and the inner cylinder 410 are shown to be concentric ... The fluid passageway 470 formed by the inner cylinder 410 and extends through the entire nozzle regulator 105 such that fluid can flow through the passageway 470. FIG. 6 illustrates an end view of the inlet side 430 of the automatically deformable nozzle regulator 105."

FIG. 1 illustrates an exemplary application of a venturi pump containing the automatically deformable nozzle regulator. The details of the operation of the nozzle regulator in this application are described in the following sections of the specification: in the replacement paragraph starting on page 7, line 4; on page 7, lines 14-27; and in the replacement paragraph starting on page 7, line 29. Further technical details of the operation of the nozzle regulator, along with various advantages of the nozzle regulator in particular operating conditions, are described on page 11, line 17 – page 12, line 28 of the specification.

In view of the preceding discussion, with reference to selected portions of the Appellant's specification, it should be clear that **the *entire* claimed nozzle regulator is made of a *deformable* material**. This is in contrast to conventional nozzle regulators which are either completely made of a rigid or substantially rigid material, or are made partly of a rigid material and partly of a deformable material.

c. Subject Matter of Independent Claim 15:

In general, the subject matter of independent claim 15 relates to an "automatically deformable nozzle regulator ... for use in a venturi pump." (refer to page 3, lines 17-18 of the specification). As explained on page 6, lines 15-24 of the specification: "When incorporated into the venturi pump ... the automatically deformable nozzle regulator transforms the venturi pump into an outlet side regulated venturi pump. This is achieved because the nozzle regulator ... is made from a deformable material ... Because the nozzle regulator is deformable ... the area of the outlet nozzle can be decreased by deformation of the nozzle regulator such that the throat-to-outlet area ratio is increased. From Bernoulli's equation, it follows that an increase in the throat-to-outlet area ratio leads to a decrease in pressure at the throat."

As explained on page 6, line 26 – page 7, line 2 of the specification: "Once incorporated into the venturi pump ... the automatically deformable nozzle regulator automatically determines when additional suction force (or low pressure) is needed at the throat and decreases its output area accordingly ... this automatic determination is a physical phenomenon based on backpressure that the nozzle regulator experiences. Because the nozzle regulator is deformable, an increase in backpressure constricts the nozzle regulator and decreases its outlet area, thereby lowering the pressure at the throat and creating additional suction force."

More particularly, as explained in the replacement paragraph starting on page 7, line 4 of the specification: "FIG. 1 illustrates an exemplary embodiment of a venturi pump containing the automatically deformable nozzle regulator described herein being used in a fluid-pumping environment ... In general, the fluid-pumping environment 100 includes the automatically deformable nozzle regulator 105 which is incorporated into a venturi pump body 110. This combination of the nozzle regulator 105 and the venturi body 110 creates an outlet side regulated venturi pump 115. The pump 115 is disposed in a fluid (such as water) and is used to draw the fluid into the pump and output the fluid at another location." As further explained on page 7, lines 17-27 of the specification: "A fluid pressure source 130 (such as a garden hose) is connected to a primary inlet 135 of the pump 115 to

provide a motive force. As shown by the arrows, water under pressure is displaced from the fluid pressure source 130 through the pump 115. A secondary inlet 140 is in fluid communication with a throat 145. The velocity of the water 125 through the primary inlet 135 and the throat 145 creates a low-pressure area at the throat (and secondary inlet 140). This low-pressure area draws up the water 125 in the tank 120 into the secondary inlet 140 and into the throat where the incoming water mixes with water entering through the primary inlet 135. The combination of water then passes through the flexible nozzle regulator 115."

As explained on page 8, lines 6-7 of the specification: "The automatically deformable nozzle regulator ... is designed to be incorporated into the outlet area of a venturi pump." As explained on page 8, lines 23-29 of the specification: "FIG. 3 illustrates a cutaway side view of the venturi pump 115 and the flexible nozzle regulator 105 shown in FIGS. 1 and 2. The primary inlet is in fluid communication with a venturi 300. The smallest radius portion of the venturi is the throat 310. The secondary inlet 140 is in fluid communication with the throat 310 as the inlet 140 opens into the throat 310. Downstream from the venturi 310 and within a cavity of the outlet portion 200 is disposed the automatically deformable nozzle regulator 105."

Further technical details of the operation of the nozzle regulator, along with various advantages of the nozzle regulator in particular operating conditions, are described on page 11, line 17 – page 12, line 28 of the specification.

In view of the preceding discussion, with reference to selected portions of the Appellant's specification, it should be clear that the claimed outlet side regulated venturi pump includes an ***automatically deformable*** **nozzle regulator** located on its outlet side, where the nozzle regulator ***automatically adjusts*** **its output area to further decrease the pressure** in a cavity located at an outlet of a venturi throat located within the pump. This is in contrast to conventional venturi pumps where the dimensions of the pump do *not* automatically change based on the pressure in a cavity located at an outlet of a venturi throat located within the pump.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

a. The Final Office Action rejected independent claim 1 and dependent claims 2-3 under 35 USC **§102(b)** as being anticipated by **Strumbos** (US Patent No. 3,605,672). This rejection of independent **claim 1** and dependent **claim 3** is appealed.

b. The Final Office Action rejected independent claim 9 and dependent claim 14 under 35 USC **§103(a)** as being obvious over **Strumbos** (US Patent No. 3,605,672). This rejection of independent **claim 9** is appealed.

c. The Final Office Action rejected independent claim 15 under 35 USC **§103(a)** as being obvious over Tash et al. ("**Tash**," US Patent No. 4,963,073) **in view of Strumbos** (US Patent No. 3,605,672). This rejection of independent **claim 15** is appealed.

d. The Office Action rejected claims 1-20 under 35 USC **§103(a)** as being obvious over **Popov** (US Patent No. 6,250,890) **in view of** Blackshear et al. ("**Blackshear**," US Patent No. 3,667,069). This rejection of independent **claim 1**, dependent **claim 3**, independent **claim 9**, dependent **claim 11** and independent **claim 15** is appealed.

VII. ARGUMENT

The following arguments present the rationale for the patentability of independent claim 1, dependent claim 3, independent claim 9, dependent claim 11 and independent claim 15. The specific rejections of dependent claims 10, 12-14, 16 and 19 are not argued separately, as it is believed that the patentability of their independent parent claims 9 and 15 negates the specific rejections advanced with respect to these dependent claims.

a. <u>Rejection of Independent Claim 1 under 35 U.S.C. §102(b):</u>

Independent claim 1 was rejected under 35 USC §102(b) based on the rationale that the Strumbos reference teaches all the features of this claim. The Examiner responded to the Appellant's arguments for patentability as follows:

(i) In the Final Office Action the Examiner contended that the arguments presented "are not persuasive" because: "[A]utomatic means a machine operating without human intervention: a machine that controls its own operating process ... Strumbos further teaches that the "distributing valve can be in operational connection with the helmsman's steering control or the valve can be integrated into the craft's autopilot or automatic steering system." ... Thus, ... Strumbos does teach automatic inflation and deflation of the sector members."

(ii) In the Advisory Action dated October 10, 2006 the Examiner further contended: "In response to applicants argument that the Strumbos does not teach the automatic changes in the radius of the cylinder, it should be understood that the pressure dependence on velocity automatically controls radius. Please refer to Column 6 lines 48-53 of Strumbos. It explains the co-relation between the velocity of fluid over a surface and the pressure on the surface (It is also explained in Column 12, lines 24-42)."

The Appellant respectfully suggests that claim 1 is not anticipated by Strumbos for the following reasons.

In independent claim 1 the **Appellant claims** a nozzle regulator which includes an **inner tubular cylinder whose radius *<u>automatically decreases</u>* when a fluid flowing *<u>within</u>* the inner cylinder experiences a *<u>backpressure</u>***, and when the backpressure is removed from the fluid flowing within the inner cylinder, the **radius of the inner cylinder *<u>automatically increases</u>* back to its original dimension**. As discussed in section V(a) above, this claimed feature results in an automatically deformable nozzle regulator which automatically determines when additional suction force is needed at the regulator's inlet and automatically decreases the regulator's output area accordingly based on backpressure that the regulator experiences. It is important to note that the Appellant's claimed nozzle regulator operates in a completely self-contained manner, automatically adjusting the radius of its inner cylinder based *<u>only</u>* on the backpressure of the fluid flowing within the cylinder, without requiring any sort of auxiliary controller or other apparatus

external to the nozzle regulator. This is advantageous since it results in a nozzle regulator whose design and construction is much simpler, and hence much lower cost and much higher reliability, than one which requires an external auxiliary controller.

In contrast, the **Strumbos reference teaches** a directional control apparatus made up of a "rigid outer wall or shroud" (refer to column 5, line 18) with inflatable elastic sector members which are "bonded or otherwise suitably attached to the inside surface of [the] shroud." (refer to column 5, lines 37-38) Strumbos further teaches that the **sector members are inflated and deflated under the *control of a "fluid circuit"* which is *external* to the rigid outer wall and sector members**. More particularly, Strumbos teaches: "[A] steering force is provided selectively by the [directional control apparatus] by means of a *controlled* inflation and deflation of the sector members. Any suitable means for accomplishing this controlled inflation and deflation may be employed: a suitable fluid circuit for the purpose is illustrated in FIG. 2. As shown, each sector member 16 through 19 is connected by means of fluid passages 34 to supply conduits 35, 36, 37 and 38 which lead through distributing valve 39 to a suitable supply 40 of pressurized fluid … distributing valve 39 can be in operational connection with the helmsman's steering control … or the valve can be integrated into the craft's autopilot or automatic steering system …" (refer to column 5, lines 49-62 – emphasis added).

Thus, the **Strumbos reference teaches** that there are ***multiple* sources of the pressurized fluid**. Strumbos further teaches that **each source of pressurized fluid is *independently controlled* by an *external circuit*, it is independently connected to a different sector member in order to *selectively inflate or deflate* the sector member, and it flows *only* into and out of the particular sector member it is connected to,** hence altering the steering force and related directional control of the apparatus. In contrast to the Appellant's claimed nozzle regulator described above, **the pressurized fluid taught in Strumbos does *not* flow *within* the inner tubular cylinder created by the inflatable sector members. Nowhere does Strumbos teach that changes in the *backpressure* in the fluid that flows *within* the inner cylinder created by the inflatable sector members results in *automatic* changes in the radius of this cylinder** as is claimed by the Appellant.

Regarding the Examiner's contentions noted in items (i) and (ii) above, the Appellant responds as follows. The Examiner appears to conclude in the combination of these contentions that the Strumbos reference teaches the Appellant's above noted claimed feature in which the radius of the inner tubular cylinder *automatically* decreases and increases based on changes in the *backpressure* of the fluid flowing *within* the inner cylinder. The Appellant respectfully suggests that this is clearly not the case for the following reasons. In column 6, line 31 – column 7, line 38 and in column 12, lines 24-42, **Strumbos teaches that a *controlled* inflation and deflation of the inflatable sector members produces a directional "*steering force*" on the "craft"** or "vehicle" containing the directional control apparatus. In other words, contrary to the Examiner's item (ii) contention that "the pressure dependence on velocity automatically controls radius," Strumbos teaches that ***no* change in the radius occurs due to pressure changes in the fluid flowing *within* the inner cylinder created by the inflatable elastic sector members**. Rather Strumbos teaches that the forces produced on the various inflatable elastic sector members, by the fluid flowing within the inner cylinder created by the sector members, act to steer the craft. They do *not* act to change the independently controlled inflation/deflation of the various sector members. Therefore, as stated above, nowhere does Strumbos teach that changes in the *backpressure* in the fluid that flows *within* the inner cylinder created by the inflatable sector members results in *automatic* changes in the radius of the inner cylinder created by the inflatable elastic sector members.

Thus, it should be clear that the Appellant's claimed invention provides a nozzle regulator that is patentably distinct from, and has advantages not appreciated by, the directional control apparatus taught by the Strumbos reference. It should also be clear that the Appellant's invention as claimed by independent claim 1 includes a feature not taught by Strumbos. Consequently, the rejection of claim 1 under 35 USC §102(b) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 1 under 35 USC §102(b) based on its following novel language:

> "an inner tubular cylinder having a second radius that is less than the first radius, wherein the outer tubular cylinder and the inner tubular cylinder are concentric about a longitudinal direction, and wherein the inner tubular cylinder is made of a deformable material such that <u>when a fluid within the inner tubular</u>

cylinder experiences a backpressure, the second radius automatically decreases, but when the backpressure is removed the second radius automatically increases back to its original dimension;"

b. Rejection of Dependent Claim 3 under 35 U.S.C. §102(b):

Claim 3 is dependent on independent claim 1 which is discussed in section VII(a) above. Dependent claim 3 was rejected under 35 USC §102(b) based on the rationale that the Strumbos reference teaches the feature of this claim. The Appellant respectfully suggests that claim 3 is not anticipated by Strumbos for the following reasons.

In dependent claim 3 the **Appellant claims that the *entire* nozzle regulator is constructed of a *deformable* material**. This claimed feature is advantageous for a number of different reasons. For example, it results in a nozzle regulator which can be manufactured from a single material. It also results in a nozzle regulator which can be manufactured as a single part. Thus, the Appellant's claimed nozzle regulator has a design and construction which is much simpler and hence much lower cost and much higher reliability, than one which is based on multiple types of materials and multiple, separately manufactured piece parts which must then be assembled together.

In contrast, the **Strumbos reference teaches** a directional control apparatus made up of a "***rigid*** **outer wall** or shroud" (refer to column 5, line 18) **with inflatable elastic sector members** which are "bonded or otherwise suitably attached to the inside surface of [the] shroud." (refer to column 5, lines 37-38) Strumbos further teaches that the sector members are inflated and deflated under the control of a "**fluid circuit**" which is external to the outer wall and sector members. The fluid circuit includes items such as a "source of pressurized fluid" and a "distributing valve" which independently controls the flow of the pressurized fluid to each inflatable sector member via "supply conduits" on the outer wall. (refer to column 5, lines 49-66 and FIG. 2 which provide a description of the fluid circuit and its interconnection to the outer wall and each inflatable sector member) **Nowhere does Strumbos teach that the *entire* directional control apparatus is constructed of a *deformable* material** (i.e. including the outer wall, fluid circuit items, etc.), as is claimed by the Appellant. Besides the obvious functional issues that would arise if one were to attempt to construct the entire fluid circuit from a deformable material, the Appellant

believes that the **outer wall is *__required__* to be *__rigid__*** in order for the inflatable sector members to maintain their general shape and orientation to each other. In fact, the Appellant believes that if the outer wall *were* constructed of a deformable material, the directional control apparatus taught by Strumbos would become ***__non-functional__***.

Thus, it should be clear that the Appellant's claimed invention provides a nozzle regulator that is patentably distinct from, and has advantages not appreciated by, the directional control apparatus taught by the Strumbos reference. It should also be clear that the Appellant's invention as claimed by dependent claim 3 includes a feature not taught by Strumbos. Consequently, the rejection of claim 3 under 35 USC §102(b) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 3 under 35 USC §102(b) based on its following novel language:

> "The nozzle regulator as set forth in claim 1, wherein the entire nozzle regulator is constructed of the deformable material."

c. **Rejection of Independent Claim 9 under 35 U.S.C. §103(a) Over Strumbos:**

Independent claim 9 was rejected under 35 U.S.C. §103(a) based on the rationale that the Strumbos reference teaches all the features of this claim with the exception of "an inlet section having a convergent cross-sectional shape that connects the outer cylinder and the inner cylinder at the inlet side such that the fluid enters the nozzle regulator at the inlet section and flows into the fluid passageway." However, in the Final Office Action the Examiner contended that "Strumbos does disclose "Kort Nozzles" and how they are a very well known prior art" and that "Kort Nozzles have a convergent cross-sectional shape," so that "at the time of invention it would have been obvious to one of ordinary skill in the art to have an inlet section having a convergent cross-sectional shape that connects the outer cylinder and the inner cylinder at the inlet side such that the fluid enters the nozzle regulator at the inlet section and flows into the fluid passageway, for the purpose of regulating the fluid flow at a constant rate irrespective of the amount of fluid flowing through the tube." The Appellant respectfully suggests that claim 9 is not obvious over Strumbos for the following reasons.

In independent claim 9 the **Appellant claims** an automatically deformable nozzle regulator which includes, among other things, an outer cylinder and an inner cylinder which is located concentrically within the outer cylinder, where the outer and inner cylinders are connected at an inlet side of the outer cylinder. In claim 9 the Appellant further claims that the **nozzle regulator is constructed (*entirely*) of a *deformable* material**. This claimed feature is advantageous for a number of different reasons, one example of which is discussed in section VII(b) above.

In contrast, as discussed in section VII(b) above, the **Strumbos reference teaches** a directional control apparatus made up of a ***rigid* outer wall with inflatable elastic sector members** which are attached to the inside surface of the outer wall. Strumbos further teaches that the sector members are inflated and deflated under the control of a "**fluid circuit**" which is external to the outer wall and sector members. **Nowhere does Strumbos teach that the *entire* directional control apparatus is constructed of a *deformable* material** (i.e. including the outer wall, fluid circuit items, etc.), as is claimed by the Appellant. As also discussed in section VII(b), the Appellant believes that Strumbos' **outer wall is *required* to be *rigid*** in order for the inflatable sector members to maintain their general shape and orientation to each other. In fact, the Appellant believes that if Strumbos' outer wall *were* constructed of a deformable material, the directional control apparatus taught by Strumbos would become ***non-functional***. Incorporating the well known prior art of Kort Nozzles does not change or add anything to these teachings of Strumbos.

Thus, it should be clear that the Appellant's claimed invention provides an automatically deformable nozzle regulator that is patentably distinct from the directional control apparatus taught by the Strumbos reference, as well as the combination of Strumbos and Kort Nozzles. It should also be clear that the Appellant's invention as claimed by independent claim 9 includes a feature not taught by Strumbos, or Strumbos in view of Kort Nozzles. It should also be clear that the Appellant's invention as claimed by claim 9 has advantages not appreciated by, nor contemplated, nor in any way rendered obvious by Strumbos, or Strumbos in view of Kort Nozzles. Consequently, the rejection of claim 9 under 35 USC §103(a) is not proper. Accordingly, the Appellant respectfully

requests reconsideration of the rejection of claim 9 under 35 USC §103(a) based on its following non-obvious language:

> "wherein the automatically deformable nozzle regulator is constructed of a deformable material."

d. **Rejection of Independent Claim 15 under 35 U.S.C. §103(a) over Tash in view of Strumbos**

Independent claim 15 was rejected under 35 U.S.C. §103(a) based on the rationale that the Tash reference teaches all the features of this claim with the exception of the following feature: "an automatically deformable nozzle regulator in fluid communication with the venturi throat and cavity that automatically adjusts its output area to further decrease the pressure in the cavity." However, in the Final Office Action the Examiner contended that the Strumbos reference "discloses an automatically deformable nozzle regulator" and "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Tash et al. over Strumbos to design a regulated [venturi] pump that is easy to operate and does not require [any] external energy sources and is also very cost efficient because of its simple design." The Appellant respectfully suggests that claim 15 is not obvious over Tash in view of Strumbos for the following reasons.

In independent claim 15 the Appellant claims an outlet side regulated venturi pump for pumping fluid which includes a primary inlet that receives a fluid pressure source, a venturi throat that is in fluid communication with the primary inlet, where the venturi throat decelerates the fluid and creates a low-pressure area in a cavity located at an outlet of the venturi throat, and a secondary inlet that is in fluid communication with the venturi throat and cavity, where the secondary inlet allows a fluid being pumped to be drawn through the secondary inlet into the cavity by the low-pressure area in the cavity. The **Appellant** also **claims** that the pump includes an automatically deformable nozzle regulator that is in fluid communication with the venturi throat and cavity, where the **automatically deformable nozzle regulator *automatically adjusts* its output area to further decrease the pressure in the cavity**. This claimed feature is advantageous for a number of different reasons. For example, as described on page 11, line 17 – page 12, line 7 of the

specification, if debris such as a rock or leaves is blocking the secondary inlet, this claimed feature results in an increase in the venturi effect of the pump and provides increased suction force at the secondary inlet, which usually acts to dislodge, fragment or disintegrate the debris that is blocking the secondary inlet.

In contrast, the Tash reference teaches a pump which uses water pressure supplied from a garden hose in order to power the pump. Tash further teaches that the *entire* pump is *rigidly* constructed (refer to column 2, lines 37-39 which state that "the pump itself is molded of high impact plastic or a like material"). **No part of the pump taught by Tash is *deformable*. Furthermore, nowhere does Tash teach that the pump includes an automatically deformable nozzle regulator that *automatically adjusts* its output area** to further decrease the pressure inside a cavity in the pump.

In further contrast, as discussed in section VII(a) above, the **Strumbos reference also does not teach an automatically deformable nozzle regulator that is in fluid communication with a venturi throat and a cavity which is located at an outlet of the venturi throat, where the nozzle regulator is in fluid communication with the venturi throat and cavity, and where the nozzle regulator automatically adjusts its output area to further decrease the pressure inside the cavity**.

Thus, it should be clear that the Appellant's claimed invention provides an outlet side regulated venturi pump that is patentably distinct from the pump taught by the Tash reference, and the directional control apparatus taught by the Strumbos reference, and the combination of Tash and Strumbos. It should also be clear that the Appellant's invention as claimed by independent claim 15 includes a feature not taught by Tash, or Strumbos, or the combination of Tash and Strumbos. It should also be clear that the Appellant's invention as claimed by claim 15 has advantages not appreciated, or contemplated, or in any way rendered obvious by Tash, or Strumbos, or the combination of Tash and Strumbos. Consequently, the rejection of claim 15 under 35 U.S.C. §103(a) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 15 under 35 U.S.C. §103(a) based on its following non-obvious claim language:

"an automatically deformable nozzle regulator in fluid communication with the venturi throat and cavity that automatically adjusts its output area to further decrease the pressure in the cavity."

e. Rejection of Claims 1, 3, 9, 11 and 15 under 35 U.S.C. §103(a) over Popov in view of Blackshear

e.1 Independent Claim 1:

Independent claim 1 was rejected under 35 U.S.C. §103(a) based on the rationale that the Popov reference teaches all the features of this claim with the exception of the following features: "the inner tubular cylinder is made of a deformable material," and "when a fluid within the inner tubular cylinder experiences a backpressure, the second radius automatically decreases, but when the backpressure is removed the second radius automatically increases back to its original dimension." However, the Examiner made the following related contentions:

(i) In the Final Office Action the Examiner contended that the Blackshear reference "discloses a pump that is made of a deformable material and also it is entirely made out of the said material (Column 5, lines 42-45). At the time of invention it would have been obvious to one skilled in the art to make the entire nozzle regulator of deformable material for the purposes of efficiently controlling the fluid flow by using a deformable nozzle that is simple and durable."

(ii) In the Final Office Action the Examiner further contended that Blackshear "also provide[s] teachings for the backpressure in the fluid within the nozzle regulator (Column 2, lines 10-25). At the time of invention it would have been obvious to one skilled in the art to make the nozzle regulator of deformable material, as it is available in numerous varieties to suit the needs for flexibility and strength. The regulator made out of deformable material will also be elastically stronger."

(iii) In the Advisory Action dated October 10, 2006, the Examiner responded to the Appellant's arguments for patentability by yet further contending: "With regard to applicant's argument that there is no teaching for the complete assembly to be made out of deformable material, it is clearly stated by Blackshear et al that the entire pump as disclosed in the patent can desireably be made out of carbon based resins and fluorinated silicone rubbers. Rubbers are known to be capable of being deformed."

The Appellant respectfully disagrees with these contentions and respectfully suggests that claim 1 is not obvious over Popov in view of Blackshear for the following reasons.

In independent claim 1 the **Appellant claims** a nozzle regulator which includes **an inner tubular cylinder made of a *deformable* material, where the radius of the inner cylinder *automatically decreases* when a fluid flowing within the inner cylinder experiences a *backpressure***, and when the backpressure is removed from the fluid flowing within the inner cylinder, the **radius of the inner cylinder *automatically increases* back to its original dimension**. As discussed in section V(a) above, this claimed feature results in an automatically deformable nozzle regulator which automatically determines when additional suction force is needed at the regulator's inlet and automatically decreases the regulator's output area accordingly based on backpressure that the regulator experiences. This claimed feature is advantageous for a number of different reasons which have been discussed heretofore, one example of which is discussed in section VII(d) above.

In contrast, the Popov reference teaches a liquid-gas jet apparatus for evacuation/discharge of vapor-gas mediums. Popov further teaches that the jet apparatus generally pertains to the field of vacuum jet technology applied in various industrial processes (refer to column 1, lines 3-6), and more specifically can be applied "especially in the petrochemical industry for vacuum refinement of an oil stock in rectifying vacuum columns." (refer to column 3, lines 38-41) Popov yet further teaches that "the technical problem to be solved by this invention is an increase of reliability of a liquid-gas jet apparatus by provision of a more steady flow of an ejecting liquid medium and reduction of energy losses during interaction of the ejecting medium with an evacuated (passive) medium." (refer to column 1, lines 33-38) More particularly, Popov teaches an apparatus made up of a "nozzle for feed of an ejecting liquid medium and a mixing chamber" which "includes a collection of shaped channels" where "the collection of channels comprises a central channel placed in alignment to the mixing chamber and a number of peripheral channels uniformly allocated around the central channel" (refer to column 1, lines 40-45), and where an ejecting liquid medium flows into and through the nozzle and entrains a

gaseous or vapor-gaseous evacuated medium into the mixing chamber, resulting in the formation of a gas-liquid medium which passes out of the mixing chamber (refer to column 3, lines 27-34). **Nowhere does Popov teach that *any* part of the apparatus is *deformable* or ever changes any of its dimensions while operating, or that *any* part of the apparatus is made of a *deformable* material.**

In further contrast, the Blackshear reference teaches an implantable cardiac/heart pump device for replacing or assisting a disabled right heart. (refer to Abstract) More particularly, Blackshear teaches "an implantable jet pump cardiac ... right ventricle replacement device" that works "in conjunction with left ventricle support yielding total heart support." (refer to column 1, lines 8-11) Granted, Blackshear does teach a venturi-type pumping device in which "the pressure source for the driving fluid of the jet pump is the left heart." (refer to column 2, lines 40-41) However, **Blackshear teaches that "the device is made of substantially *rigid*, substantially *non-flexing* material**" (refer to column 4, lines 46-47) "**which [is] capable of *maintaining* the shape and alignment of the parts**." (refer to column 5, lines 34-36) **Nowhere does Blackshear teach that *any* part of the device is *deformable* or ever changes any of its dimensions** while in operation (under *any* condition). Correspondingly, **nowhere does Blackshear teach that *any* part of the device is made of a *deformable* material**. This is further reinforced by the following Blackshear teachings:

> "the driving fluid ... is mixed with the venous blood in the jet pump. The combined flow is then passed into the pulmonary circulation at the proper head. The pulmonary flow *necessarily exceeds* the systemic flow by an amount equal to the driving flow. This increase in pulmonary flow is not a significant factor, since it has been shown ... that pulmonary flow may be increased three to four fold with little or no increase in pulmonary arterial pressure. However, the magnitude of this driving flow is of importance, and is minimized by careful design. Shunts ... may be used to reduce the volume of flow ..." (refer to column 2, lines 57-69 – emphasis added)

> "The driving flow rate is dependent *solely* upon the driving pressure and the driving nozzle diameter and profile ... the driving nozzle velocity depends *only* upon the driving pressure and nozzle profile, so that the flow rate is governed by the chosen nozzle. No control is necessary." (refer to column 3, lines 14-19 – emphasis added).

> "Because the driving nozzle diameter is *fixed*, the driving flow rate is dependent *only* upon *driving* pressure." (refer to column 3, lines 38-40 – emphasis added)

Hence, **Blackshear teaches that there is *no* automatic deformation of the driving nozzle and *no* automatic control of the flow rate based on *deformation* of the driving nozzle due to *backpressure* at the driving nozzle**.

With particular regard to the Examiner's contentions (i), (ii) and (iii) noted above, for the reasons just discussed, the Appellant respectfully suggests that Blackshear does *not* disclose a pump made of a deformable material, but to the contrary, **Blackshear actually *teaches away from* making *any* part of the cardiac/heart pump device of a *deformable* material**. Granted Blackshear teaches that "[t]he entire pump may desireably be manufactured from low energy materials, examples of which include ... fluorinated silicone rubbers." (refer to column 5, lines 42-45) However, although *some* types of rubbers are capable of being deformed as noted in the Examiner's contention (iii), *other* types of rubbers are substantially rigid and are *not* capable of being deformed. Therefore, based on Blackshear's aforementioned teaching that the pumping device must be made of substantially *rigid*, substantially *non-flexing* material, it is clear that the **type of rubber used to manufacture the device must be substantially *rigid* and *non-flexing* (i.e. *not* deformable).** Furthermore, the Appellant respectfully suggests that nowhere does Blackshear teach that the driving nozzle automatically adjusts its radius based on backpressure it experiences, but to the contrary, Blackshear actually *teaches away from* this feature. Finally, Blackshear teaches a venturi-style pumping device in column 2, lines 9-34, in which the pressure differential between a high pressure driving fluid and a fluid to be pumped, which is at a lower pressure, creates a suction force which cases the fluid to be pumped to flow into the pumping device. The Appellant does not understand the Examiner's contention in item (ii) that based on this teaching, it would have been obvious to make Blackshear's driving nozzle out of a deformable material, especially since as just stated Blackshear actually teaches away from this.

Thus, it should be clear that the Appellant's claimed invention provides a nozzle regulator that is patentably distinct from the liquid-gas jet apparatus taught by the Popov reference, and the implantable cardiac/heart pump device taught by the Blackshear reference, and the combination of Popov and Blackshear. It should also be clear that the

Appellant's invention as claimed by independent claim 1 includes features not taught by Popov, or Blackshear, or the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by claim 1 has advantages not appreciated by, or contemplated, or in any way rendered obvious by Popov, or Blackshear, or the combination of Popov and Blackshear. Consequently, the rejection of claim 1 under 35 USC §103(a) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 1 under 35 USC §103(a) based on its following non-obvious language:

> "an inner tubular cylinder having a second radius that is less than the first radius, wherein the outer tubular cylinder and the inner tubular cylinder are concentric about a longitudinal direction, and wherein <u>the inner tubular cylinder is made of a deformable material such that when a fluid within the inner tubular cylinder experiences a backpressure, the second radius automatically decreases, but when the backpressure is removed the second radius automatically increases back to its original dimension</u>;"

Additionally, the Appellant respectfully suggests that a prima facie case of obviousness can not be established because **Popov and Blackshear are non-analogous art**, both compared to each other and compared to the subject application. MPEP (Eighth Edition, Latest Revision October 2005) §2141.01(a) states:

> ""In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992)."

> ""A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992)"

> "where the general scope of a reference is outside the pertinent field of endeavor, the reference may be considered analogous art if subject matter disclosed therein is relevant to the particular problem with which the inventor is involved. *State Contracting & Eng'g Corp. v. Condotte America, Inc.*, 346 F.3d 1057, 1069, 68 USPQ2d 1481, 1490 (Fed. Cir. 2003)"

The subject application resides in the field of nozzle regulators for use in venturi pumps for pumping an assortment of fluids in industrial, commercial and home applications. The subject application solves problems with existing venturi pumps such as their inability to continue to pump when the fluid level at the outlet of the pump reaches a certain height, and reduced pump performance due to debris or other contaminants blocking the secondary inlet, or rigid foreign objects in the fluid being pumped getting lodged in the outlet nozzle – which could completely shut down the pump. (refer for example to published subject application paragraphs [0001, 0002 and 0007]) In contrast, as discussed above, both Popov and Blackshear reside in very different fields of technology and application, and solve very different types of problems as compared to the subject application. More particularly, Popov resides in the field of vacuum jet technology for evacuating vapor-gas mediums in various industrial processes, especially in the petrochemical industry. Blackshear resides in the medical industry, and more particularly in the field of implantable cardiac/heart pump technology for replacing or assisting a disabled right heart. As such, the Appellant respectfully suggests that **neither Popov nor Blackshear are relevant to the aforementioned problems that the subject application is concerned with, nor would Popov or Blackshear have commended themselves to the attention of an inventor seeking to solve said problems.**

e.2 <u>Dependent Claim 3</u>:

Claim 3 is dependent on independent claim 1 which is discussed in section VII(e.1) above. Dependent claim 3 was rejected under 35 U.S.C. §103(a) based on the rationale that although the Popov reference does not teach the feature of this claim, this feature is obvious over Blackshear. The Examiner's contentions noted in items (i) and (iii) of section VII(e.1) provided the basis for this obviousness rationale. The Appellant respectfully disagrees with these contentions and respectfully suggests that claim 3 is not obvious over Popov in view of Blackshear for the following reasons.

In dependent claim 3 the Appellant claims that the ***<u>entire</u>* nozzle regulator is constructed of a *<u>deformable</u>* material**. This claimed feature is advantageous for a number of different reasons which have been discussed heretofore, one example of which is discussed in section VII(d) above.

In contrast, as discussed in section VII(e.1), **nowhere does the Popov reference teach that *any* part of the apparatus is constructed of a *deformable* material.**

In further contrast, as discussed in section VII(e.1), the **Blackshear reference teaches that the device is made of substantially *rigid*, substantially *non-flexing* material which is capable of *maintaining* the shape and alignment of its parts.** Correspondingly, **nowhere does Blackshear teach that *any* part of the device is constructed of a *deformable* material.** In fact, to the contrary as discussed in section VII(e.1), **Blackshear teaches that there is *no* automatic deformation of the driving nozzle and *no* automatic control of the flow rate based on deformation of the driving nozzle.** The Appellant's responses to the aforementioned Examiner's contentions in items (i) and (iii) are discussed in section VII(e.1).

Thus, it should be clear that the Appellant's claimed invention provides a nozzle regulator that is patentably distinct from the liquid-gas jet apparatus taught by the Popov reference, and the implantable cardiac/heart pump device taught by the Blackshear reference, and the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by dependent claim 3 includes features not taught by Popov, or Blackshear, or the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by claim 3 has advantages not appreciated by, or contemplated, or in any way rendered obvious by Popov, or Blackshear, or the combination of Popov and Blackshear. Consequently, the rejection of claim 3 under 35 USC §103(a) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 3 under 35 USC §103(a) based on its following non-obvious language:

> "The nozzle regulator as set forth in claim 1, wherein the entire nozzle regulator is constructed of the deformable material."

Additionally, as discussed in section VII(e.1) above, the Appellant respectfully suggests that a prima facie case of obviousness can not be established because **Popov and Blackshear are non-analogous art**, both compared to each other and compared to the subject application. As such, the Appellant respectfully suggests that **neither Popov**

nor Blackshear are relevant to the aforementioned problems that the subject application is concerned with, nor would Popov or Blackshear have commended themselves to the attention of an inventor seeking to solve said problems.

e.3 Independent Claim 9:

Independent claim 9 was rejected under 35 U.S.C. §103(a) based on the rationale that the Popov reference teaches all the features of this claim with the exception of the feature in which "the automatically deformable nozzle regulator is constructed of a deformable material," but that this feature is obvious over Blackshear. The Examiner's contentions noted in items (i) and (iii) of section VII(e.1) above provided the basis for this obviousness rationale. The Appellant respectfully disagrees with these contentions and respectfully suggests that claim 9 is not obvious over Popov in view of Blackshear for the following reasons.

As discussed in section VII(c) above, in independent claim 9 the **Appellant claims an automatically deformable nozzle regulator which is constructed (*entirely*) of a *deformable* material.** This claimed feature is advantageous for a number of different reasons which have been discussed heretofore, one example of which is discussed in section VII(d) above.

In contrast, as discussed in section VII(e.1), **nowhere does the Popov reference teach that *any* part of the apparatus is constructed of a *deformable* material**.

In further contrast, as discussed in section VII(e.1), the **Blackshear reference teaches that the device is made of substantially *rigid*, substantially *non-flexing* material which is capable of *maintaining* the shape and alignment of its parts.** Correspondingly, **nowhere does Blackshear teach that *any* part of the device is constructed of a *deformable* material**. In fact, to the contrary as discussed in section VII(e.1), **Blackshear teaches that there is *no* automatic deformation of the driving nozzle and *no* automatic control of the flow rate based on deformation of the driving nozzle**. The Appellant's responses to the aforementioned Examiner's contentions in items (i) and (iii) are discussed in section VII(e.1).

Thus, it should be clear that the Appellant's claimed invention provides a nozzle regulator that is patentably distinct from the liquid-gas jet apparatus taught by the Popov reference, and the implantable cardiac/heart pump device taught by the Blackshear reference, and the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by independent claim 9 includes features not taught by Popov, or Blackshear, or the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by claim 9 has advantages not appreciated by, or contemplated, or in any way rendered obvious by Popov, or Blackshear, or the combination of Popov and Blackshear. Consequently, the rejection of claim 9 under 35 USC §103(a) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 9 under 35 USC §103(a) based on its following *non-obvious language*:

> "wherein <u>the automatically deformable nozzle regulator is constructed of a deformable material</u>."

Additionally, as discussed in section VII(e.1), the Appellant respectfully suggests that a prima facie case of obviousness can not be established because **Popov and Blackshear are non-analogous art**, both compared to each other and compared to the subject application. As such, the Appellant respectfully suggests that **neither Popov nor Blackshear are relevant to the aforementioned problems that the subject application is concerned with, nor would Popov or Blackshear have commended themselves to the attention of an inventor seeking to solve said problems.**

e.4 <u>Dependent Claim 11</u>:

Claim 11 is dependent on claim 10, which is dependent on independent claim 9, which is discussed in sections VII(c) and VII(e.3) above. Dependent claim 11 was rejected under 35 U.S.C. §103(a) based on the rationale that although the Popov reference does not teach the feature of this claim, this feature is obvious over Blackshear. The Examiner's contentions noted in items (i) and (ii) of section VII(e.1) above provided the basis for this obviousness rationale. The Appellant respectfully disagrees with these contentions and respectfully suggests that claim 11 is not obvious over Popov in view of Blackshear for the

following reasons.

In dependent claim 11 the **Appellant claims** an automatically deformable nozzle regulator which includes a nozzle regulator cavity located between the outer cylinder and inner cylinder, where the nozzle regulator cavity is sealed at the inlet side of the nozzle regulator and open at the outlet side so that fluid only flows into the nozzle regulator cavity from the outlet side, and where ***backpressure*** **in the fluid within the nozzle regulator cavity generates a constricting force that causes the radius of the inner cylinder to** ***decrease***. As discussed in section V(a) above, this claimed feature result in an automatically deformable nozzle regulator which automatically determines when additional suction force is needed at the regulator's inlet and automatically decreases the regulator's output area accordingly based on backpressure that the regulator experiences. This claimed feature is advantageous for a number of different reasons which have been discussed heretofore. For example, as discussed in section VII(d) above, if debris such as a rock or leaves is blocking the inlet side of the nozzle regulator, this claimed feature results in an increase in the suction force at the inlet side, which usually acts to dislodge, fragment or disintegrate the debris that is causing the blockage.

In contrast, as discussed in section VII(e.1), **nowhere does the Popov reference teach that** ***any*** **part of the apparatus is** ***deformable*** **or ever changes any of its dimensions while operating**.

In further contrast, as discussed in section VII(e.1), the **Blackshear reference teaches that the device is made of substantially** ***rigid*****, substantially** ***non-flexing*** **material which is capable of** ***maintaining*** **the shape and alignment of its parts**. Correspondingly, **nowhere does Blackshear teach that** ***any*** **part of the device is constructed of a** ***deformable*** **material**. In fact, to the contrary as discussed in section VII(e.1), **Blackshear teaches that there is** ***no*** **automatic deformation of the driving nozzle and** ***no*** **automatic control of the flow rate based on** ***deformation*** **of the driving nozzle due to** ***backpressure*** **at the driving nozzle**. The Appellant's responses to the aforementioned Examiner's contentions in items (i) and (ii) are discussed in section VII(e.1).

Thus, it should be clear that the Appellant's claimed invention provides a nozzle regulator that is patentably distinct from the liquid-gas jet apparatus taught by the Popov reference, and the implantable cardiac/heart pump device taught by the Blackshear reference, and the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by dependent claim 11 includes a feature not taught by Popov, or Blackshear, or the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by claim 11 has advantages not appreciated by, or contemplated, or in any way rendered obvious by Popov, or Blackshear, or the combination of Popov and Blackshear. Consequently, the rejection of claim 11 under 35 USC §103(a) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 11 under 35 USC §103(a) based on its following non-obvious language:

> "The automatically deformable nozzle regulator as set forth in claim 10, wherein a backpressure in the fluid within the nozzle regulator cavity generates a constricting force that causes a radius of the inner cylinder to decrease."

Additionally, as discussed in section VII(e.1), the Appellant respectfully suggests that a prima facie case of obviousness can not be established because **Popov and Blackshear are non-analogous art**, both compared to each other and compared to the subject application. As such, the Appellant respectfully suggests that **neither Popov nor Blackshear are relevant to the aforementioned problems that the subject application is concerned with, nor would Popov or Blackshear have commended themselves to the attention of an inventor seeking to solve said problems.**

e.5 Independent Claim 15:

Independent claim 15 was rejected under 35 U.S.C. §103(a) based on the rationale that the Popov reference teaches all the features of this claim with the exception of the feature in which an automatically deformable nozzle regulator, which is in fluid communication with a venturi throat and a cavity located at an outlet of the venturi throat, automatically adjusts its output area to further decrease the pressure in a cavity, but that this feature is obvious over Blackshear. The Examiner's contentions noted in items (i) and (ii) of section VII(e.1) above provided the basis for this obviousness rationale. The

Appellant respectfully disagrees with these contentions and respectfully suggests that claim 15 is not obvious over Popov in view of Blackshear for the following reasons.

As discussed in section VII(d) above, in independent claim 15 the **Appellant claims** an outlet side regulated venturi pump for pumping fluid where the pump includes an automatically deformable nozzle regulator that is in fluid communication with a venturi throat and cavity in the pump, where the **automatically deformable nozzle regulator *automatically adjusts* its output area to further decrease the pressure in the cavity**. An example advantage of this feature is also described in section VII(d).

In contrast, as discussed in section VII(e.1), **nowhere does the Popov reference teach that *any* part of the apparatus is *deformable* or ever changes any of its dimensions while operating**.

In further contrast, as discussed in section VII(e.1), the **Blackshear reference teaches that the device is made of substantially *rigid*, substantially *non-flexing* material which is capable of *maintaining* the shape and alignment of its parts**. Correspondingly, **nowhere does Blackshear teach that *any* part of the device is constructed of a *deformable* material**. In fact, to the contrary as discussed in section VII(e.1), **Blackshear teaches that there is *no* automatic deformation of the driving nozzle and *no* automatic control of the flow rate based on deformation of the driving nozzle**. The Appellant's responses to the aforementioned Examiner's contentions in items (i) and (ii) are discussed in section VII(e.1).

Thus, it should be clear that the Appellant's claimed invention provides a nozzle regulator that is patentably distinct from the liquid-gas jet apparatus taught by the Popov reference, and the implantable cardiac/heart pump device taught by the Blackshear reference, and the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by independent claim 15 includes features not taught by Popov, or Blackshear, or the combination of Popov and Blackshear. It should also be clear that the Appellant's invention as claimed by claim 15 has advantages not appreciated by, or contemplated, or in any way rendered obvious by Popov, or Blackshear, or the combination of Popov and Blackshear. Consequently, the rejection of claim 15 under 35

USC §103(a) is not proper. Accordingly, the Appellant respectfully requests reconsideration of the rejection of claim 15 under 35 USC §103(a) based on its following non-obvious language:

> "an automatically deformable nozzle regulator in fluid communication with the venturi throat and cavity that automatically adjusts its output area to further decrease the pressure in the cavity."

Additionally, as discussed in section VII(e.1), the Appellant respectfully suggests that a prima facie case of obviousness can not be established because **Popov and Blackshear are non-analogous art**, both compared to each other and compared to the subject application. As such, the Appellant respectfully suggests that **neither Popov nor Blackshear are relevant to the aforementioned problems that the subject application is concerned with, nor would Popov or Blackshear have commended themselves to the attention of an inventor seeking to solve said problems.**

VIII. CLAIMS APPENDIX

The claims listed below provide a complete copy of all claims involved in the Appeal:

Listing of Claims:

1. A nozzle regulator, comprising:

an outer tubular cylinder having a first radius;

an inner tubular cylinder having a second radius that is less than the first radius, wherein the outer tubular cylinder and the inner tubular cylinder are concentric about a longitudinal direction, and wherein the inner tubular cylinder is made of a deformable material such that when a fluid within the inner tubular cylinder experiences a backpressure, the second radius automatically decreases, but when the backpressure is removed the second radius automatically increases back to its original dimension; and

an inlet section that connects the outer tubular cylinder and the inner tubular cylinder at an inlet side in the longitudinal direction.

3. The nozzle regulator as set forth in claim 1, wherein the entire nozzle regulator is

constructed of the deformable material.

9. An automatically deformable nozzle regulator, comprising:

an outer cylinder having a hollow interior and an inlet side and a outlet side at opposite end of the cylinder along a longitudinal direction;

an inner cylinder disposed concentrically within the outer cylinder and having a fluid passageway in the longitudinal direction such that fluid can flow through the fluid passageway from the inlet side to the outlet side; and

an inlet section having a convergent cross-sectional shape that connects the outer cylinder and the inner cylinder at the inlet side such that the fluid enters the nozzle regulator at the inlet section and flows into the fluid passageway;

wherein the automatically deformable nozzle regulator is constructed of a deformable material.

10. The automatically deformable nozzle regulator as set forth in claim 9, further comprising a nozzle regulator cavity bounded by the outer cylinder, the inner cylinder and the inlet section such that the inlet side of the nozzle regulator cavity is sealed and the outlet side of the nozzle regulator cavity is open so that fluid can only flow into the nozzle regulator cavity from the outlet side.

11. The automatically deformable nozzle regulator as set forth in claim 10, wherein a backpressure in the fluid within the nozzle regulator cavity generates a constricting force that causes a radius of the inner cylinder to decrease.

12. The automatically deformable nozzle regulator as set forth in claim 9, further comprising an output nozzle projecting from the outlet side of the outer cylinder and being part of the inner cylinder such that a surface area of the output nozzle is capable of being in contact with the fluid.

13. The automatically deformable nozzle regulator as set forth in claim 12, wherein a backpressure in fluid surrounding the output nozzle generates a constricting force causing a radius of the inner cylinder to decrease.

14. The automatically deformable nozzle regulator as set forth in claim 9, wherein the

deformable material comprises rubber.

15. An outlet side regulated venturi pump for pumping fluid, comprising:

a primary inlet that receives a fluid pressure source such that fluid under pressure flows from the fluid pressure source to the primary inlet;

a venturi throat in fluid communication with the primary inlet that decelerates the fluid flowing from the primary inlet and creates a low-pressure area within a cavity located at an outlet of the venturi throat;

a secondary inlet in fluid communication with the venturi throat and cavity that allows a fluid being pumped to be drawn through the secondary inlet into the cavity by the low-pressure area in the cavity; and

an automatically deformable nozzle regulator in fluid communication with the venturi throat and cavity that automatically adjusts its output area to further decrease the pressure in the cavity.

16. The outlet side regulated venturi pump as set forth in claim 15, wherein the automatically deformable nozzle regulator further comprises:

an outer tubular cylinder and an inner tubular cylinder concentrically arranged; and

an inlet section joining the cylinders at an inlet side of the nozzle regulator.

19. The outlet side regulated venturi pump as set forth in claim 16, wherein the automatically deformable nozzle regulator further comprises a nozzle regulator cavity disposed between the concentric cylinders and bounded on the inlet side by the inlet section and open on the outlet side.

IX. EVIDENCE APPENDIX

NONE

X. RELATED PROCEEDINGS APPENDIX

NONE

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